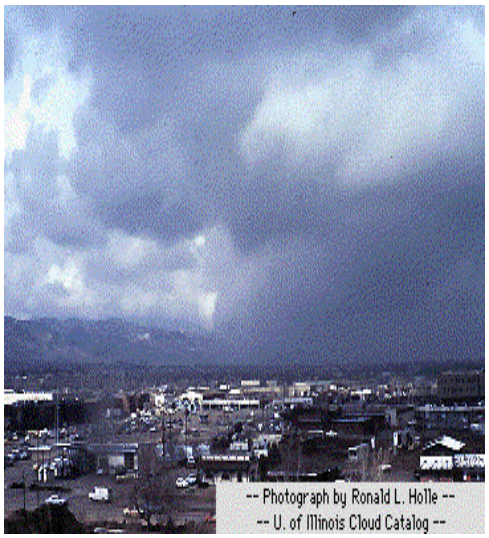
CIVIL AIR PATROL – ARUNDEL COMPOSITE SQUADRON

July 2004	SAFETY	THUNDERSTORMS

When you leave your home in the morning and look up at the sky, you can get a fairly good idea about the weather for the day. The appearance of the clouds can also tell you what to expect. For example:

Cirrus Clouds
Fair Weather Clouds

Altocumulus Clouds
Warm and humid summer morning, followed by rain later



Nimbostratus or Cumulonimbus Clouds
Rain Clouds

Clouds are a part of nature's water cycle. As such, the principles of evaporation and condensation play a major role in their formations. Warm air, carrying moisture (water vapor), rise like a hot-air balloon to higher and higher elevations in the sky. As the warm air rises, it encounters cooler air from the surroundings. This cooler air condenses the water vapor into tiny liquid droplets. We see these tiny liquid droplets as clouds in the sky. Each cloud contains millions and millions of these tiny water droplets. Just as the warm air rises, the cooler air tends to sink as long as it can stay cooler than its surroundings. Meteorologists call this rising warm air stream as updraft, and the sinking cooler air as downdraft.

Updrafts and downdrafts create atmospheric instability, and play a major role in the formation of thunderstorms. The more severe the updraft or downdraft, the more severe the thunderstorm becomes. Four common types of thunderstorms have been identified:

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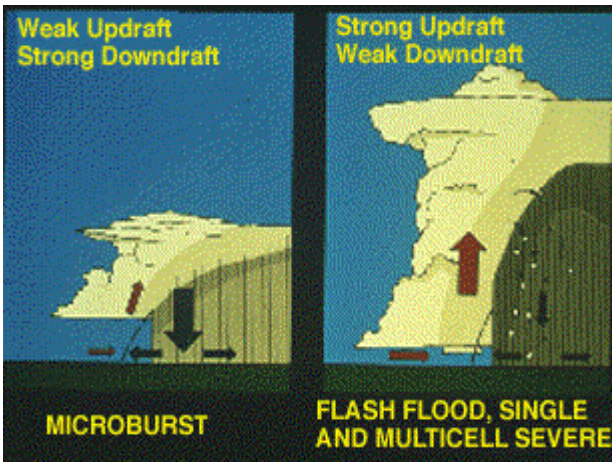

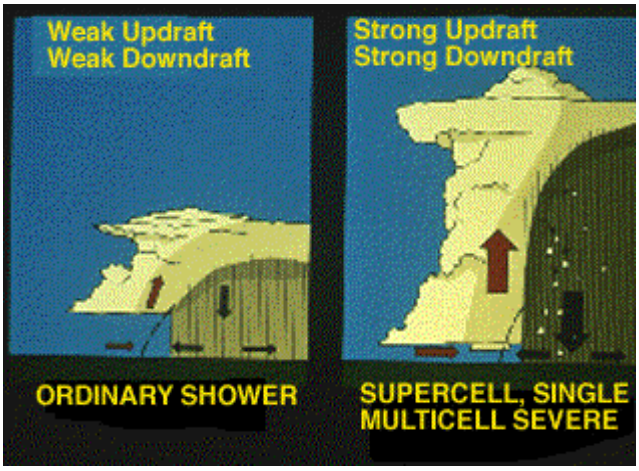

(1) **(2)** **(3)** **(4)**

1. **When the low-level air is unstable but relatively dry and adequate mid-level moisture is present, a storm with a weak updraft but a strong downdraft can develop. These storms usually occur on high terrain, such as the western U.S. They can produce moderate rain but typically no hail.**

2. **Strong updraft and weak downdraft storms often form in very moist atmospheres where there is little dry air and evaporative cooling to drive downdrafts. These storms dump a lot of heavy rain and sometimes even hail.**

3. **Weak updrafts and downdrafts produce non-severe showers and relatively mild thunderstorms.**

4. **Strong updrafts and downdrafts frequently produce destructive thunderstorms, hail, and sometimes even tornadoes. As one would expect, the most severe storms, including supercells, have strong vertical updrafts and downdrafts, and occur in unstable atmospheres.**

Thunderstorms are also classified as single cell, multicell/multicell lines (squall lines), and supercell.

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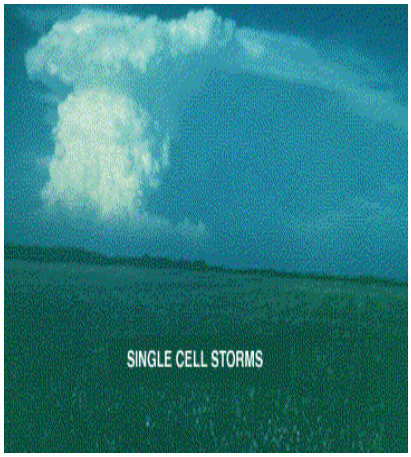

(1)

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1. **Single cell thunderstorms do not produce severe weather and usually last for only 20-30 minutes.**

2. **Multicell thunderstorms and squall lines consist of a group of cells moving as a single unit. Individual cells take turns at being the most dominant. Flash floods, downburst winds, and occasional hail are the main threats. The heaviest precipitation likely falls beneath the highest cloud top.**

3. **Supercell thunderstorms frequently have a deep rotating updraft. These are the most dangerous storms because of the extreme weather generated. Individual updraft elements usually merge into the main rotating updraft and then explode vertically, rather than develop into separate and competing thunderstorm cells. Supercells produce flash floods, large hail, and can develop into tornadoes.**

SAFETY in THUNDERSTORMS

1. **Before the Storm Comes:**
   - **Keep an eye on the sky; look for darkening skies and increasing wind**
   - **Listen to weather radio/TV updates**

2. **When the Storm Approaches:**
   - **Find shelter in a building or car**
   - **Keep windows closed or rolled-up**
   - **Stay away from water (ocean, swimming pool, bath, shower, or sink)**
   - **Secure outdoor objects, such as lawn furniture**
   - **If you are in the woods, take shelter under the <u>shortest</u> trees**

- **Stay away from tall trees, poles, or metal objects, and make sure that you pick a place not subject to flooding**
- **In a hail storm, take cover immediately (including your pets/animals)**
- **If indoors, turn off electrical appliances and air conditioner. Power surges from lightning can overload these**
- **Draw blinds or shades over the window. This will prevent broken glass from shattering into your home**

3. **Recommended Disaster Supplies On Hand:**
   - **Flashlight with extra batteries**
   - **Battery operated radio with extra batteries**
   - **First aid kit**
   - **Emergency food, water, and medication (including prescription medication)**
   - **Cash and credit cards**
   - **Non-electric can opener**
   - **Sturdy shoes**

DID YOU KNOW……..

- **At any given moment, nearly 1,800 thunderstorms are in progress over the surface of the earth**
- **On the average, the United States gets 100,000 thunderstorms each year. Approximately 1,000 tornadoes develop from these storms**
- **Large hail results in nearly $1 billion in damage to property and crops**
- **Straight-line winds exceeding 100 mph are responsible for most thunderstorm damage**
- **The power of lightning's electrical charge and intense heat can electrocute on contact, split trees, ignite fires, and cause electrical failures**

GET MORE INFORMATION

References:

1. http://ww2010.atmos.uiuc.edu/
2. http://science.howstuffworks.com/
3. http://www.fema.gov/hazards/thunderstorms/
4. http://www.redcross.org/
5. http://www.stormfax.com/